

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant : Tadashi Katafuchi

Serial No.: 10/590,934

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For : LUBRICATING OIL COMPOSITION FOR DIESEL ENGINE

Art Unit & Examiner : 1797, GOLOBOY, JAMES C

DECLARATION UNDER 37 C.F.R. §1.132

COMMISSIONER FOR PATENTS
ALEXANDRIA, VIRGINIA 22313

SIR:

Now comes Yasunori Shimizu who deposes and states:

1. That I am a graduate of Osaka Prefecture University and received a master's degree in the year 2006.
2. That I have been employed by Idemitsu Kosan Co. Ltd., for 4 years as a researcher in the field of lubricating oil.
3. That I understand the English language or, at least, that the contents of the Declaration were made clear to me prior to executing the same.
4. That the following experiments were carried out by me or under my direct supervision and control.

5. Comparative Experiment A

The procedures of Example 3 of the patent specification are repeated except that boronic compound of decenylsuccinimide (mono-based) as the component (A) is replaced by boronic compound of decenylsuccinimide (bis-based), provided that the amount added of the boronic compound of decenylsuccinimide (bis-based) is

changed to 9.5 % by mass in order to adjust the amount of boron content in the composition to the same as one of Example 3.

6. Results

The results of the Comparative Experiment A are shown in the Table A given below together with the results of Example 3 of the patent specification.

Table A

		Comparative Experiment A	Example 3	
Composition (mass %)	Base oil ¹⁾	88.5	93	
	Component (A)			
	Succinimide A-1 ²⁾			
	Succinimide A-2 ³⁾		5	
	Succinimide A-3 ^{3')}	9.5		
	Component (B)			
	Polybutenyl succinimide B-1 ⁴⁾	2	2	
	Polybutenyl succinimide B-2 ⁵⁾			
	Component (C)			
	Ashless antiwear agent ⁶⁾	0	0	
Property & Performance	Kinematic Viscosity at 100°C	mm ² /s	12.3	11.5
	Base Value	KOHmg/g	5.2	5.3
	Boron Content	ppm by mass	950	950
	Sulfated ashes	% by mass	<0.1	<0.1
	Detergency: Hot Tube Test			
	Score		1	8
	Remained Base Value	KOHmg/g	0.7	1.3
	Antiwear test: Complete contact load	MPa	<0.049	0.069

*1: hydrotreated mineral oil; kinematic viscosity at 100 °C ; 9.24 mm²/s, viscosity index ; 106, sulfur content ; <5 ppm by mass

*2: decenylsuccinimide (mono-based); nitrogen content ; 58,000 ppm by mass

*3: boronic compound of decenylsuccinimide (mono-based) : nitrogen content ; 55,000 ppm by mass, boron content ; 19,000 by mass

*3': boronic compound of decenylsuccinimide (bis-based) : nitrogen content ; 28,000 ppm by mass, boron content ; 10,000 by mass

*4: polybutenyl group having number average molecular weight of 1,000, succinimide (bis-based) : nitrogen content ; 2,100 ppm by mass

*5: polybutenyl group having number average molecular weight of 1,000, boronic compound of succinimide (bis-based) : nitrogen content ; 1,800 ppm by mass, boron content; 1,900 ppm by mass

*6: dibenzyl disulfide

7. Discussion

From the comparison of the results of Comparative Experiment A (using bis-based boronic compound of decenylsuccinimide) and the results of Example 3 (using mono-based boronic compound of decenylsuccinimide), it was shown that Comparative Experiment A is extremely inferior to the Example 3 in detergency and antiwear. That is, our invention using the mono-type decenylsuccinimide shows unexpected results compared with the bis-type decenylsuccinimide.

8. The undersigned petitioner declares further that all statements made herein of his own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of this application or any patent issuing thereon.

9. Further deponent saith not.

Yasunori Shimizu
Signature: Yasunori Shimizu
Aug. 16, 2010.
Date